

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Currently Amended) A variable compression ratio system for an internal combustion engine, comprising:

a variable compression ratio mechanism for continuously varying a compression ratio of the internal combustion engine, the variable compression ratio mechanism including a control shaft rotatably moveable to a rotational position corresponding to the compression ratio;

a hydraulic actuator driving the control shaft to the rotational position depending on operating conditions of the internal combustion engine;

a hydraulic pressure source mechanically driven by the internal combustion engine to produce a hydraulic pressure supplied to the hydraulic actuator; and

a hydraulic control ~~means for variably controlling~~ mechanism to variably control the hydraulic pressure supplied to the hydraulic actuator on the basis of the operating conditions of the internal combustion engine,

wherein the hydraulic control mechanism comprises a controller programmed to determine a target hydraulic pressure by selecting a larger one of a first hydraulic pressure required to allow rotation of the control shaft to vary the compression ratio of the internal combustion engine such that knocking does not occur in the engine and a second hydraulic pressure required for holding the control shaft at a rotational position to maintain the compression ratio of the internal combustion engine.

2. (Canceled).

3. (Currently Amended) The variable compression ratio system as claimed in claim 1, ~~claim 2~~, wherein the hydraulic control mechanism ~~control means~~ comprises a selector valve electronically connected to the controller and operated to ~~switch supply of~~ supply the hydraulic pressure from the hydraulic pressure source to the hydraulic actuator, the selector valve being disposed between the hydraulic actuator and the hydraulic pressure source, the

controller being programmed to variably control a hydraulic pressure upstream of the selector valve based on the operating conditions of the internal combustion engine.

4. (Original) The variable compression ratio system as claimed in claim 3, further comprising a pressure sensor operative to detect the hydraulic pressure upstream of the selector valve and transmit a signal indicative of the detected hydraulic pressure, the controller being programmed to determine the hydraulic pressure supplied to the hydraulic actuator on the basis of the signal.

5. (Withdrawn) The variable compression ratio system as claimed in claim 4, wherein the hydraulic control mechanism ~~control means~~ comprises a variable relief valve disposed between the selector valve and the hydraulic pressure source, the variable relief valve being electronically connected to the controller and operated to release an amount of hydraulic fluid discharged from the hydraulic pressure source, the controller being programmed to determine the amount of hydraulic fluid to be released through the variable relief valve on the basis of the signal.

6. (Currently Amended) The variable compression ratio system as claimed in claim 4, wherein the hydraulic control mechanism ~~control means~~ comprises a check valve disposed between the selector valve and the hydraulic pressure source and a hydraulic accumulator disposed between the check valve and the selector valve, the controller being programmed to variably control a hydraulic pressure within the hydraulic accumulator.

7. (Currently Amended) The variable compression ratio system as claimed in claim 6, wherein the hydraulic control mechanism ~~control means~~ comprises an unloading valve disposed between the hydraulic pressure source and the check valve, the unloading valve being electronically connected to the controller and operated to release the hydraulic pressure discharged from the hydraulic pressure source when the hydraulic pressure within the hydraulic accumulator is more than a predetermined hydraulic pressure.

8. (Withdrawn) The variable compression ratio system as claimed in claim 6, wherein the hydraulic control mechanism ~~control means~~ comprises a clutch mechanism for coupling the hydraulic pressure source to the internal combustion engine, the clutch mechanism being electronically connected to the controller and operated to prevent the coupling between the hydraulic pressure source and the internal combustion engine when the hydraulic pressure within the hydraulic accumulator is more than a predetermined hydraulic pressure.

9. (Withdrawn) The variable compression ratio system as claimed in claim 8, wherein the operating conditions comprise engine speed, the controller is programmed to control the hydraulic pressure supplied to the hydraulic actuator so as to minimize the compression ratio of the internal combustion engine and operate the clutch mechanism to prevent the coupling between the hydraulic pressure source and the internal combustion engine, when the engine speed exceeds a predetermined speed.

10. (Original) The variable compression ratio system as claimed in claim 1, wherein the internal combustion engine has a supercharger.

11. (Currently Amended) The variable compression ratio system as claimed in claim 1, wherein the variable compression ratio mechanism comprises an upper link having one end coupled to a piston via a piston pin, a lower link pivotally coupled to the upper link and pivotally supported on a crankshaft via a crankpin, and ~~the control shaft~~ a control link having one end pivotally coupled to the lower link and an opposite end pivotally supported on an eccentric cam disposed on the control shaft.

12. (Original) A method for controlling a variable compression ratio system for an internal combustion engine, the variable compression ratio system including a variable compression ratio mechanism for continuously varying a compression ratio of the internal combustion engine, a hydraulic actuator driving the variable compression ratio mechanism, and a hydraulic pressure source mechanically driven by the internal combustion engine to produce a hydraulic pressure, the hydraulic actuator being supplied with the hydraulic pressure from the

hydraulic pressure source via a hydraulic passage extending therebetween, the method comprising:

- detecting operating conditions of the internal combustion engine;
- determining a predetermined hydraulic pressure to be supplied to the hydraulic actuator on the basis of the detected operating conditions of the internal combustion engine;
- detecting a hydraulic pressure within the hydraulic passage; and
- controlling the hydraulic pressure supplied to the hydraulic actuator to the predetermined hydraulic pressure on the basis of the detected hydraulic pressure within the hydraulic passage.

13. (Currently Amended) The method as claimed in claim 12, wherein the predetermined hydraulic pressure comprises a target hydraulic pressure determined by selecting a larger one of a first hydraulic pressure required ~~for satisfying responsivity of the variable compression ratio mechanism upon varying the compression ratio of the internal combustion engine to~~ allow rotation of a control shaft to vary the compression ratio of the internal combustion engine such that knocking does not occur in the engine and a second hydraulic pressure required for holding the variable compression ratio mechanism at an operational position to maintain the compression ratio of the internal combustion engine.

14. (Original) The method as claimed in claim 12, wherein the variable compression ratio system comprises a selector valve disposed between the hydraulic actuator and the hydraulic pressure source, the selector valve being operative to switch supply of the hydraulic pressure to the hydraulic actuator via the hydraulic passage.

15. (Original) The method as claimed in claim 14, wherein the detecting operation comprises detecting a hydraulic pressure within the hydraulic passage between the selector valve and the hydraulic pressure source, the method further comprising comparing the detected hydraulic pressure within the hydraulic passage between the selector valve and the hydraulic pressure source with the predetermined hydraulic pressure, the controlling operation comprising reducing the hydraulic pressure within the hydraulic passage when the detected

hydraulic pressure within the hydraulic passage between the selector valve and the hydraulic pressure source is more than the predetermined hydraulic pressure.

16. (Original) The method as claimed in claim 15, wherein the reducing operation comprises releasing an amount of hydraulic fluid within the hydraulic passage between the selector valve and the hydraulic pressure source when the detected hydraulic pressure within the hydraulic passage between the selector valve and the hydraulic pressure source is more than the predetermined hydraulic pressure.

17. (Currently Amended) The method as claimed in claim 16, wherein the variable compression ratio system further comprises a check valve disposed between the selector valve and the hydraulic pressure source, and the predetermined hydraulic pressure is an upper limit pressure within the hydraulic passage between the selector valve and the check valve.  
~~hydraulic pressure source.~~

18. (Currently Amended) The method as claimed in claim 17, further comprising comparing the detected hydraulic pressure within the hydraulic passage between the selector valve and the check valve ~~hydraulic pressure source~~ with the upper limit pressure.

19. (Currently Amended) The method as claimed in claim 15, wherein the reducing operation ~~comprising~~ comprises preventing the coupling between the hydraulic pressure source and the internal combustion engine.

20. (Original) The method as claimed in claim 15, wherein the operating conditions comprise engine speed, the method further comprising comparing the detected engine speed with a predetermined speed, the reducing operation comprising preventing the coupling between the hydraulic pressure source and the internal combustion engine when the detected engine speed exceeds predetermined speed.